UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,259	02/06/2006	Shigeo Yukawa	10873.1819USWO	3059

52835 7590 12/21/2007

HAMRE, SCHUMANN, MUELLER & LARSON, P.C.
P.O. BOX 2902
MINNEAPOLIS, MN 55402-0902

EXAMINER	
DOAK, JENNIFER L	

ART UNIT	PAPER NUMBER
2872	

MAIL DATE	DELIVERY MODE
12/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/567,259	YUKAWA ET AL.	
	Examiner	Art Unit	
	Jennifer L. Doak	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/14/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Background Art disclosure (hereinafter "Background") in view of Kashima et al. (US 6,333,817)(hereinafter "Kashima").

Regarding Claim 1, Applicant discloses as prior art, a retroreflective sheet comprising a surface layer including at least one layer, a focusing layer containing glass spheres, and a metal reflective layer on the back side of the focusing layer, wherein the glass spheres are disposed (para. [0002], [0012]), and the metal reflective layer (Fig. 8: 14) is formed on the back side of the focusing layer to follow the shape of the glass spheres (Fig. 8). Applicant's prior art disclosure does not show that the spheres are disposed at random locations in the thickness direction of the focusing layer. Applicant's disclosed Prior Art and Kashima are analogous because both concern optical sheets with beads for affecting a light beam. Kashima teaches that the beads (20) are randomly disposed in the focusing layer (18) (Kashima, Fig. 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to randomly distribute the beads in the focusing layer, since randomizing the position of the beads to reduce interference fringes from other elements of the sheet and is economical.

Regarding Claims 2-5, Kashima further teaches the glass spheres include a glass sphere group B in contact with the surface layer, and a glass sphere group A located away from the surface layer and wherein the proportion of glass spheres in contact with the surface layer is from 50 to 90 wt % of the total glass spheres (Fig. 2; col. 8, lines 54-56). Kashima does not explicitly teach

> the glass sphere group A exhibits retroreflective performance at a larger observation angle than the observation angle of the glass sphere group B, or that the glass spheres include a glass sphere group B in contact with the surface layer, and a glass sphere group A located away from the surface layer, and the metal reflective layer of the glass sphere group B is formed at a focus formation position, the thickness of the focusing layer of the glass sphere group A is less than the thickness of the focusing layer of the glass sphere group B, and the glass sphere group A exhibits retroreflective performance at a relatively larger observation angle than the glass sphere group B; or that the glass spheres include a glass sphere group B in contact with the surface layer, and a glass sphere group A located away from the surface layer, and the focusing layer formed in the form of concentric circles on the glass sphere surfaces of the glass sphere group B has a thickness at which the maximum reflective performance is exhibited at an observation angle of 0.2.degrees and an incidence angle of 5.degree., the thickness of the focusing layer of the glass sphere group A is less than the thickness of the focusing layer of the glass sphere group B, and the glass sphere group A exhibits retroreflective performance at a relatively larger observation angle than the glass sphere group B.

However, these limitations are inherent to the structure previously recited, and the claim language is necessarily met by that structure. Absent a showing to the contrary, the features recited above would be met by the structure of the combined teachings of the prior art or would be met during use of the same.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Background Art disclosure (hereinafter "Background") in view of Kashima et al. (US 6,333,817)(hereinafter "Kashima") in further view of Searight (US 3,204,537).

Regarding Claim 6, the Background-Kashima combination does not explicitly disclose that the refractive index of the spheres ranges from 2.10 to 2.40. The Background and Searight are analogous art because they are both retroreflective devices for highways that use glass spheres. Searight discloses that the refractive index of the spheres can be 2.1 (col. 2, lines 37-41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use glass beads with refractive index in the range of 2.1 to 2.4 in the retro-reflective Background-Kashima combination, since changes in the refractive index can be used to adjust the reflective performance of the beads.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Background Art disclosure (hereinafter "Background") in view of Kashima et al. (US 6,333,817)(hereinafter "Kashima") in further view of Palmquist (US 3,014,409).

Regarding Claim 7, Kashima further discloses that at least 80% of the spheres have a median diameter within a range of .+-.10 . μ.m (col. 4, lines 37-38), but the Background-Kashima combination does not disclose that the glass spheres have a median diameter within a range of at least 35 .μ.m and no more than 75 μm. Background and Palmquist are analogous art because they are both retro-reflectors using glass beads. Palmquist teaches a diameter range of 25 to 75 μm. Therefore, absent a showing of criticality, it would have been obvious to one of ordinary skill in the art at the time the invention was made to limit the range of diameter of the spheres to the named range, since it could simplify the maintaining of consistency of the coating process.

Claims 8-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Background Art disclosure (hereinafter "Background") in view of Kashima et

al. (US 6,333,817)(hereinafter "Kashima") in further view of Hedblom et al. (US 6,365,262)(hereinafter "Hedblom").

Regarding Claims 8-18, the Kashima further teaches the use of polymer resins, but does not expound into many specifics regarding further chemical composition, such as is claimed in Claims 8-18. Background, Kashima, and Hedblom are all analogous art because they all are directed to retro-reflective devices that contain beads in a resin layer. Hedblom does teach that specific chemicals can be used, including polyvinyl acetal resin, polyvinyl butyral resin, olefin copolymers, polyester resins, alkyd resins, polyurethane resins, vinyl resins, and acrylic polymers (col. 7, lines 18-33; col. 9, lines 10-37; col. 10, lines 1-19). The weight relationships, transition point temperatures, solvent relationships, and related anti-foaming agents are not explicitly disclosed, but are well known in the art. Therefore, absent a showing of criticality, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the chemicals and the claimed relations, since they result in retro-reflectors that remain retro-reflective in wet or dry conditions.

Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Background Art disclosure (hereinafter "Background") in view of Kashima et al. (US 6,333,817)(hereinafter "Kashima").

Regarding Claims 19-21, Background discloses an external illumination system, comprising a sign having a sign face with a retroreflective sheet comprising a surface layer including at least one layer, a focusing layer containing glass spheres (para. [0002], [0012]), and a metal reflective layer on the back side of the focusing layer (Fig. 8, 14), and the metal reflective layer is formed on the back side of the focusing layer to follow the shape of the glass

spheres (Fig. 8). Applicant's disclosed Prior Art and Kashima are analogous because both concern optical sheets with beads for affecting a light beam. Kashima teaches that the beads (20) are randomly disposed in the focusing layer (18) (Kashima, Fig. 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to randomly distribute the beads in the focusing layer, since randomizing the position of the beads reduces interference fringes from other elements of the sheet and is economical.

The combination does not further disclose an external illumination source wherein the external illumination source is disposed at a fixed distance from the sign, and the distance from the illumination source to the sign face is within a range of at least 1 m and no more than 100 m. However, it is notoriously well known in the art (and to most people who have driven down US highways at night) to put a lamp at a distance or 1m—100m in front of a sign. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to place an external, fixed light source in front of a retroreflective sign at a distance of 1-100m so as to illuminate the sign to improve advertisement or other information to drivers along a highway at night.

Regarding claims 20 and 21, the combination further discloses the illumination source emits light that is incident on the sign face at an incidence angle of at least 0° and no more than 50° to the sign face (Background para. 4, 5). The combination does not disclose that the color temperature of the light is 2856K. The wavelength, whose color temperature is 2856K, is a well known marker line for mercury vapor emissions. Mercury lamps are notoriously well known in the art for outdoor light sources, for signs or for general illumination. Therefore, it would have

been obvious to one of ordinary skill in the art at the time of invention to use a mercury lamp to illuminate a sign.

The combination does not explicitly disclose that the sign face exhibits reflective performance of at least 0.07 at an observation angle of 35° when reference light; retroreflective coefficient R' = I/ES·A; or that the reflective performance at an observation angle of 40° and an incidence angle of 50° is at least 0.055, and so forth as set forward in the remainder of claims 20 and 21. However, these features are seen to be an inherent teaching of that device since the structure as claimed is disclosed, and it is apparent that the same structure must be present for the device to function as intended.

Response to Arguments

Applicant's arguments filed 10/2/07 have been fully considered but they are not persuasive.

Applicant argues Kashima is not a retroreflective system; because Kashima is directed to an optical lamination sheet and therefore cannot be combined with Background; Kashima does not teach that the beads are used for focusing; Kashima's purpose is different; Kashima and Background have grossly different natures and therefore cannot be combined; the record does not show the relevance of one of the motivations given for combination ("randomizing the position of the beads prevents interference fringes from other elements of the sheet"); KSR prohibits "open season" for combining references; neither prong of the KSR analysis is present to provide reasonable basis for combination; Examiner used impermissible hindsight.

However, first, the relationship between the two pieces of prior art has been restated to clarify that both concern optical sheets with beads for affecting a light beam; it is further noted,

though, that there is inherently Fresnel reflecting from such glass surfaces unless there is a reflective coating to prevent said reflection, of which there is none disclosed here. Second, Kashima was not cited to teach that the beads focus, only that the beads may be randomly distributed.

In response to Applicant's argument that Kashima's purpose is different, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). However, in this case, one motivation supplied was to "reduce interference fringes." It is well known in the art that interference fringes may result in ordered systems, and that interference fringes diminish light quantity, and both Kashima and the invention seek to improve light quantity. Moreover, the other motivation supplied was economy, desired by both as well.

In response to Applicant's argument that the references are of different natures and there is no suggestion to combine the references, and KSR prohibits "open season" on combinations, there is no season of any kind being declared in this case, since a proper combination may be made for the purpose of solving the same problem, as stated above. Moreover, the references are analogous art, as above stated. Further, the examiner recognizes that obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the indicated motivations were found in

knowledge generally available to one of ordinary skill in the art (reduction of interference fringes), and in the reference (economy at Kashima, col. 8, ln. 60).

In response to applicant's argument that neither of KSR prongs were met, it is unclear to what "prongs" Applicant refers, since KSR required the factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), to be applied for establishing a background for determining obviousness under 35 U.S.C. 103(a):

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

In this case, these elements were met in the original rejection and in the above-stated rejection. Moreover, KSR made clear the viability, but not exclusivity or rigidity, of the Teaching-Suggestion-Motivation test, which was applied, in both rejections, in accordance with those provisions.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Doak whose telephone number is 571-272-9791. The examiner can normally be reached on Mon-Thur: 7:30A-5:00P, Alt Fri: 7:30A-4:00P (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JD
12/15/07

Stephone B. Allen
Supervisory Patent Examiner